

IN THE  
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Patrick A. Raymond, et al.

Confirmation No.:

Application No.: 09/466,025

Examiner: Huynh, Kim T.

Filing Date: 12/17/1999

Group Art Unit: 2112

Title: METHOD AND APPARATUS FOR DETECTING THE PRESENCE OF A HOT-PLUGGABLE COMPONENT IN A COMPUTER SYSTEM

Mail Stop Appeal Brief-Patents  
Commissioner For Patents  
PO Box 1450  
Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Sir:

Transmitted herewith in **triplicate** is the Appeal Brief in this application with respect to the Notice of Appeal filed on May 20, 2004.

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) \$330.00.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

( ) (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d) for the total number of months checked below:

( ) one month	\$110.00
( ) two months	\$420.00
( ) three months	\$950.00
( ) four months	\$1480.00

( ) The extension fee has already been filled in this application.

(X) (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

Please charge to Deposit Account **08-2025** the sum of \$330.00. At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees. A duplicate copy of this sheet is enclosed.

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Typed Name: Robert A. Manware

Signature: 

Respectfully submitted,

Patrick A. Raymond, et al.

By 

Robert A. Manware

Attorney/Agent for Applicant(s)

Reg. No. **48,758**

Date: **July 21, 2004**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Patrick A. Raymond et al.

Serial No.: 09/466,025

Filed: December 17, 1999

For: METHOD AND APPARATUS FOR  
DETECTING THE PRESENCE OF  
A HOT PLUGGABLE COMPONENT  
IN A COMPUTER SYSTEM

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Group Art Unit: 2112

Examiner: Huynh, Kim T.

Atty. Docket: 200304290-1  
COMP:0078/FLE

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Robert A. Manware

Sir:

**APPEAL BRIEF PURSUANT TO 37 C.F.R. §§ 1.191 AND 1.192**

This Appeal Brief is being filed in triplicate in furtherance of the Notice of Appeal mailed on May 20, 2004, and received by the Patent Office on May 24, 2004.

1. **REAL PARTY IN INTEREST**

The real party in interest is Hewlett-Packard Development Company, LP (hereinafter "HPDC"), the assignee of record in this application.

2. **RELATED APPEALS AND INTERFERENCES**

Appellants are unaware of any other appeals or interferences related to this Appeal.

The undersigned is Appellants' legal representative in this Appeal. HPDC, the Assignee of

the above-referenced application, as evidenced by the documents mentioned above, will be directly affected by the Board's decision in the pending appeal.

3. **STATUS OF CLAIMS**

Claims 1-18 are currently pending and under final rejection and, thus, are the subject of this appeal.

4. **STATUS OF AMENDMENTS**

Appellants have not submitted any amendments subsequent to the Final Office Action mailed on March 23, 2004.

5. **SUMMARY OF THE INVENTION AND OF THE DISCLOSED EMBODIMENTS**

The present application is directed to a technique for detecting the presence of hot-pluggable components in a computer system, the technique incorporating an electromagnetic energy source and an electromagnetic energy detector for determining when a hot-pluggable component's presence inhibits transmission of electromagnetic energy generated by the electromagnetic energy source. Page 1, lines 2-7. Generally speaking an electromagnetic energy source located on a first side of a system board proximate an edge connector generates electromagnetic energy directed at least toward a second opposing side of the system board. Page 5, lines 7-10. An electromagnetic energy detector located on the second side of the system board detects a presence of electromagnetic energy when a hot-pluggable component is not mated to the edge connector and the electromagnetic energy generated by the electromagnetic energy source and directed towards the electromagnetic energy detector is thereby unobstructed by the hot-pluggable component. Page 5, lines 11-15. The electromagnetic energy detector further detects an absence of electromagnetic energy when the hot-pluggable component is

mated to the edge connector and the electromagnetic energy is thereby obstructed by the hot-pluggable component. Page 5, lines 15-19.

6. **ISSUES**

**Issue No. 1:**

Whether claims 1-8, 10, 12-16 and 18 are unpatentable under 35 U.S.C. § 102(e) as being anticipated by Klein et al. (U.S. Pat. No. 6,138,194).

**Issue No. 2:**

Whether claims 9 and 11 are unpatentable under 35 U.S.C. § 103(a) over Klein et al. (U.S. Pat. No. 6,138,194) in view of Klein (U.S. Pat. No. 6,065,069).

**Issue No. 3:**

Whether claim 17 is unpatentable under 35 U.S.C. § 103(a) over Klein (U.S. Pat. No. 6,065,069).

7. **GROUPING OF CLAIMS**

In regard to Issue No. 1, claims 1, 10 and 12 will stand or fall separately. Claims 2-8 will stand or fall with claim 1. Claims 13, 14 and 18 will stand or fall with claim 12.

In regard to Issue No. 2, claim 9 will stand or fall with claim 6. Claim 11 will stand or fall with claim 10.

In regard to Issue No. 3, claim 17 will stand or fall separately.

8. **ARGUMENT**

As discussed in detail below, the Examiner has improperly rejected the pending claims. The Examiner has misapplied long-standing and binding legal precedents and principles in rejecting the claims under Sections 102(e) and 103(a). Accordingly, Appellants respectfully request full and favorable consideration by the Board, as Appellants firmly believe that claims 1-18 are currently in condition for allowance.

**Issue No. 1:**

The Examiner rejected claims 1-8, 10, 12-16 and 18 under 35 U.S.C. § 102(e) as being anticipated by Klein (U.S. Pat. No. 6,138,194). Specifically with regard to independent claims 1, 6 and 12, the Examiner stated:

Klein discloses a computer system comprising:

- an electromagnetic energy source (fig. 5, 502, 504) located on a first side of a system board proximate an connector (col. 6, lines 8-28)
- the electromagnetic energy source for generating electromagnetic energy directed at least toward a second opposing side of the system board; (col. 6, lines 8-31)
- an electromagnetic energy detector (fig. 2, 210) located on the second side of the system board the electromagnetic energy detector for detecting a presence of electromagnetic energy when a hot-pluggable component is not mated to the connector and the electromagnetic energy is thereby unobstructed by the hot-pluggable component, the electromagnetic energy detector further for detecting an absence of electromagnetic energy when the hot-pluggable is mated to the connector and the electromagnetic energy is thereby obstructed by the hot-pluggable component. (col. 4, lines 30-42), (col. 6, line 33 - col.7, line 14)

Appellants respectfully traverse this rejection for a number of reasons. Anticipation under section 102 can be found only if a single reference shows exactly what is claimed. *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 U.S.P.Q. 773 (Fed. Cir. 1985). For a

prior art reference to anticipate under section 102, every element of the claimed invention must be identically shown in a single reference. *In re Bond*, 910 F.2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990). To maintain a proper rejection under section 102, a single reference must teach each and every element or step of the rejected claim. *Atlas Powder v. E.I. du Pont*, 750 F.2d 1569 (Fed. Cir. 1984). Thus, if the claims recite even one element not found in the cited reference, the reference does not anticipate the claimed invention.

Independent claim 1 recites an electromagnetic energy source located on a first side of a system board proximate a connector, for generating electromagnetic energy directed to a second opposing side of the system board. Claim 1 further recites an electromagnetic energy detector located on the second side of the system board, for detecting the presence or absence of electromagnetic energy depending on whether a hot-pluggable component is mated to the connector. Similarly, independent claim 6 recites a means for generating electromagnetic energy located on a first side of a system board proximate a connector, the electromagnetic energy directed to a second opposing side of the system board. Claim 6 further recites a means for detecting electromagnetic energy located on the second side of the system board, for detecting the presence or absence of electromagnetic energy depending on whether a hot-pluggable component is mated to the connector. Independent claim 12 recites a method for detecting the presence of a hot-pluggable component comprising the steps of generating electromagnetic energy on a first side of a system board proximate a connector, and detecting a presence or absence of electromagnetic energy on the second opposing side of the system board depending on whether a hot-pluggable component is mated to the connector. Based on the similarity of subject matter recited in each of the independent claims, the claims are discussed together below.

The Examiner correlates the mechanical switches 502 and 504 illustrated in Fig. 5 of the Klein reference with the electromagnetic energy source recited in the present claims. Appellants respectfully traverse this assertion for a number of reasons. First, those skilled in the art will appreciate that mechanical switches do not produce electromagnetic energy and therefore, are distinguished from the presently recited electromagnetic energy source. As discussed in the background of the present specification, mechanical switches are disadvantageous in that they add cost to the computer system, require additional space and may reduce reliability due to the mechanical nature of the switches. Specification, page 4 lines 16-19. It would be advantageous, therefore, to devise a method and apparatus for detecting the presence of hot-pluggable components in a computer system *without the use of mechanical switches*. Specification, page 5, lines 1-3. The electromagnetic energy source recited in each of the present claims advantageously provides for detecting hot-pluggable components, *without using mechanical switches*. For this reason alone, the Examiner's characterization of the mechanical switches 502 and 504 as the electromagnetic energy source recited in the present claims is wholly unsupportable.

In addition to the above distinctions, the mechanical switches 502 and 504 in Klein are *not* located on a first side of a system board. As discussed above, the present claims recite "an electromagnetic energy source" or "means for generating electromagnetic energy located on a first side of a system board *proximate* a connector." Emphasis added. As clearly illustrated and described with reference to Fig. 5 in Klein, the mechanical switches 502 and 504 are not located on a system board proximate a connector, as recited in the present claims, but rather are located *within* the bus connector 402. Klein, Col. 6, lines 15-20. As defined at <http://dictionary.reference.com>, "proximate" means, "closely related in space, time, or order; very near; proximal." Proximate *does not* mean in or within, but rather next to or near.

Accordingly, the Examiner's characterization of the mechanical switches 502 and 504 in Klein as the "electromagnetic energy source located on a first side of a system board proximate a connector," as recited in the present claims, is not supportable.

Further, in the Response to Arguments section of the Final Office Action the Examiner stated:

In response to applicant's argument that Klein (194) does not teach electromagnetic energy source. As Klein (194) notes in col. 2, lines 3-15, a bus connector for receiving a bus card and a power conductor to provide an electrical coupling between the bus card and a power source. The power switch coupled between the power conductor and the bus connector to selectively provide power to a bus card in the bus connector. In addition a movement sensor for sensing a movement of the bus card from the bus connector. The controller coupled between the sensor and power switch for activation the power switch to remove power from the bus card when sensor detects a movement of the bus card from connector. Therefore, the combination of the above produce electromagnetic energy source, thus properly stated in the rejection of record.

Appellants have carefully reviewed the sections of Klein cited by the Examiner, and respectfully disagree with the Examiner's characterization. Appellants are unclear as to how the aggregate of a bus connector, bus card, power conductor, power switch, and movement sensor can produce an electromagnetic energy source. Even if the cited features could somehow be arranged to produce an electromagnetic energy source capable of producing electromagnetic energy, that is not what Klein teaches. As discussed above, mechanical switches taught by Klein do not produce electromagnetic energy and are therefore, distinguished from the presently recited electromagnetic energy source. Even if mechanical switches could be characterized as electromagnetic energy sources, the mechanical switches in Klein are *not* located on a first side of a system board proximate a connector, as recited by



the instant claims. Accordingly, the Examiner's assertion that Klein teaches the electromagnetic energy source of the present application is not supportable.

Still further, the Examiner correlates the optical card detector 210 in Klein with the presently recited electromagnetic energy detector. Appellants respectfully traverse this assertion as well. As a preliminary matter, the Examiner's citation of the mechanical switches 502 and 504 of Fig. 5 in conjunction with the optical card detector 210 of Fig. 2 in Klein to provide a basis for the rejections under 35 U.S.C. § 102 has no basis in Klein. As discussed above, elements 502 and 504 illustrated in Fig. 5 of Klein represent mechanical switches. As such, the mechanical switches 502 and 504 *do not* produce electromagnetic energy and therefore in conjunction with the optical card detector 210 of Klein would not (and cannot) correlate with the electromagnetic energy detector as recited in the claims of this application. Even if the Examiner were to characterize the light emitting diode (LED) included in the optical detector 210 as the electromagnetic energy source and the optical detector 210 as the electromagnetic energy detector, the LED/optical detector combination would not correlate with the electromagnetic energy source/detector of this application because the LED/optical detector combination is part of the connector and *not* located on the system board proximate a connector, as recited in the present claims. As with the mechanical switches 502 and 504, it is clear from Fig. 2, as well as the description thereof, that the optical card detector 210 is located *within* the bus connector 120. *See* Fig. 2; col. 4, lines, 30-32. The present claims recite an electromagnetic energy detector (or means for detecting electromagnetic energy) located on the second side of the system board. Accordingly, in addition to the inaccurate characterization in the Final Office Action of the mechanical switches 502 and 504 and the optical card detector 210, it is clear that because the optical card detector 210 is located within the connector 120, any characterization of the optical card

detector 210 as located on the second side of the system board, as recited in the present claims, is not supportable.

Further related to this point, the Examiner's comments in the Response to Arguments section of the Office Action regarding the electromagnetic energy detector are unsupportable. The Examiner suggests that because the "Klein (194) detector 210 include switch sensing a movement of the bus card (hot-pluggable component) from the connector" and "Klein discloses controller is configured to detect an insertion/removal of the card by monitoring the movement sensor," the detector 210 correlates with the electromagnetic energy detector recited in the claims of this application. Appellants respectfully traverse this assertion. As discussed above, mechanical switches do not produce electromagnetic energy and cannot correlate with the electromagnetic energy source/detector of the claims of this application. Furthermore, the optical detector 210 is *not* located on the second side of the system board, as recited in the present claims. The Examiner asserts that because the detector and the switches in Klein are located within a connector that is located on a system board, it can be said that the detector and switches are on the system board. Appellants respectfully point out that the recited electromagnetic energy source is located on a *first side* of a system board *proximate* a connector and is directed toward a *second* opposing side of the system board on which the electromagnetic energy detector is located. The recited electromagnetic energy source is not *on* the connector, but rather is located *proximate* to the connector and is located on a first side of a system board directed toward an opposing side on which the detector is located. Because the electromagnetic energy source is proximate to a connector and is located such that it is directed toward an opposing side of the board on which the detector is located, it may be inferred that the detector being on a second side of the board opposing the energy source and the detector cannot be located on the connector itself. Accordingly, the Examiner's assertion

that the detector and switches in Klein are located on a system board, proximate a connector, as recited in the claims of the present application is not supportable.

In view of the remarks set forth above, Appellants respectfully submit that the subject matter of independent claims 1, 6 and 12 is not anticipated by the Klein reference. Because the Klein reference fails to recite each of the elements in the manner set forth in the independent claims, Appellants further submit that each of the claims dependent thereon is also allowable based on the deficiencies of the Klein reference described with respect to the independent claims. Accordingly, Appellants respectfully request that the Board find claims 1-8, 12-16 and 18 patentable over the prior art of record and reverse the Examiner's rejection of those claims.

The Examiner also rejected claim 10 under 35 U.S.C. § 102 as being anticipated by Klein. While the Examiner's comments are too lengthy to be reproduced efficiently herein, Appellants respectfully traverse this rejection.

Independent claim 10 recites the limitations described above with respect to independent claim 1, and in addition recites "a second electromagnetic energy source located on the first side of the system board proximate a second end of the connector" and "a second electromagnetic energy detector located on the second side of the system board." The Examiner appears to be correlating the first mechanical switch 502 with the presently recited first electromagnetic energy source and correlating the second mechanical switch 504 with the presently recited second electromagnetic energy source. As discussed above with regard to the rejections of claim 1, the Klein reference does not disclose an electromagnetic energy source and an electromagnetic energy detector having the limitations recited in the present

claims. For this reason alone, it is clear that the Klein reference does not disclose all of the elements recited in claim 10, much less disclose a second source and a second detector as further recited in claim 10.

As discussed above, claim 10 further recites “a second electromagnetic energy source located on the first side of the system board proximate a second end of the connector,” and further recites “a second electromagnetic energy detector located on the second side of the system board.” As with the first source and first detector located on a “first side of the system board”, the first source “proximate a first end of a connector” and the second source “proximate a second end of the connector,” the presently recited second source and second detector are located on the system board, proximate the connector. As previously discussed, even if the mechanical switches 502 and 504 and the optical card detector 210 could be properly combined and correlated with the electromagnetic energy source and the electromagnetic energy detector recited in the present claims, Klein clearly teaches that the mechanical switches 502 and 504 and the optical card detector 210 are located *within* a connector, not on the system board, *proximate* a connector.

In view of the remarks set forth above, Appellants respectfully submit that the subject matter of independent claim 10 cannot be anticipated by the cited reference. For at least the reasons set forth above, it is clear that claim 10 recites elements that are not found in the Klein reference. Accordingly, Appellants respectfully request that the Board find claim 10 patentable over the prior art of record and reverse the Examiner’s rejection of that claim.

**Issue No. 2:**

The Examiner rejected claims 9 and 11 under 35 U.S.C. § 103(a) as being unpatentable over Klein et al. (U.S. Pat. No. 6,138,194) in view of Klein (U.S. Pat. No. 6,065,069). Appellants respectfully traverse these rejections.

The burden of establishing a *prima facie* case of obviousness under section 103 falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination. *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984). For a single prior art reference, the mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification. *See In re Fritch*, 23 U.S.P.Q.2d 1780, 1783-84 (Fed. Cir. 1992). Accordingly, to establish a *prima facie* case, the Examiner must not only show that the combination or modification includes *all* of the claimed elements, but also a convincing line of reason as to why one of ordinary skill in the art would have found the claimed invention to have been obvious in light of the teachings of the references. *See Ex parte Clapp*, 227 U.S.P.Q. 972 (B.P.A.I. 1985).

Claim 9 is dependent on claim 6 and claim 11 is dependent on claim 10. As discussed above with respect to the rejections under 35 U.S.C. § 102, independent claims 6 and 10 recite combinations of elements and interfunctionality which are not disclosed in the primary reference. The secondary reference does nothing to cure the deficiencies discussed above with regard to the independent claims. Appellants respectfully submit that dependent claims

9 and 11 are also allowable based on their dependency on allowable base claims.

Accordingly, Appellants respectfully request that the Board find claims 9 and 11 patentable over the prior art of record and reverse the Examiner's rejection of those claims under 35 U.S.C. § 103.

**Issue No. 3:**

The Examiner rejected claim 17 under 35 U.S.C. § 103(a) as being unpatentable over Klein et al. (U.S. Pat. No. 6,138,194). Appellants respectfully traverse this rejection.

Claim 17 is dependent on claim 12. As discussed above with respect to the rejections under 35 U.S.C. § 102, independent claim 12 recites combinations of elements and interfunctionality which are not disclosed in the cited reference. Appellants respectfully submit that dependent claim 17 is also allowable based on its dependency on allowable base claim 12, as well as based on the subject matter additionally recited in claim 17. For instance, claim 17 recites "generating a plurality of independent beams of electromagnetic energy directed toward the second opposing side of the system board, a source of each of the plurality of beams located progressively more distant from the system board," and wherein the steps of detecting further comprise "a detector of each of the plurality of beams located progressively more distant from the system board..." As with generating electromagnetic energy on a "first side of a system board proximate a connector and detecting the electromagnetic energy on a "second side of the system board," as recited in claim 12, the plurality of beams recited in claim 17 are generated and independently detected from different locations on the system board, proximate the connector. As previously discussed, even if the mechanical switches 502 and 504 and the optical card detector 210 could be properly combined and correlated with the electromagnetic energy source and the electromagnetic

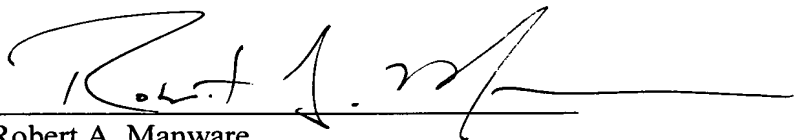
energy detector recited in the present claims, Klein clearly teaches that the mechanical switches 502 and 504 and the optical card detector 210 are located *within* a connector, not on the system board, *proximate* a connector. Thus, in accordance with Klein, any acts of generating and detecting are performed within the connector, which is in contrast with the presently recited subject matter. Accordingly, Appellants respectfully request that the Board find claim 17 patentable over the prior art of record and reverse the Examiner's rejection of that claim under 35 U.S.C. § 103.

9. **CONCLUSION**

In view of the remarks set forth above, Appellants respectfully submit that the Examiner has provided no supportable position or evidence that claims 1-18 are unpatentable over the cited references. Accordingly, Appellants respectfully request that the Board find claims 1-18 patentable over the prior art of record and reverse the Examiner's rejection of those claims.

Respectfully submitted,

Date: July 21, 2004

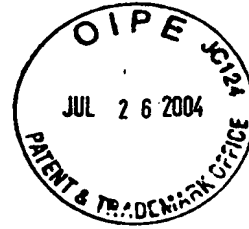
A handwritten signature in black ink, appearing to read "Robert A. Manware", written over a horizontal line.

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## **10. APPENDIX OF CLAIMS ON APPEAL**



1. A computer system comprising:

an electromagnetic energy source located on a first side of a system board proximate an connector, the electromagnetic energy source for generating electromagnetic energy directed at least toward a second opposing side of the system board; and

an electromagnetic energy detector located on the second side of the system board, the electromagnetic energy detector for detecting a presence of electromagnetic energy when a hot-pluggable component is not mated to the connector and the electromagnetic energy is thereby unobstructed by the hot-pluggable component, the electromagnetic energy detector further for detecting an absence of electromagnetic energy when the hot-pluggable component is mated to the connector and the electromagnetic energy is thereby obstructed by the hot-pluggable component.

2. The computer system, as recited in claim 1, further comprising a processor for communicating with the electromagnetic energy detector for receiving the detection of the presence or absence of electromagnetic energy by the electromagnetic energy detector.

3. The computer system, as recited in claim 2, further comprising a hard drive for storing an indication that the hot-pluggable component is absent when the presence of electromagnetic energy is detected, the hard drive further for storing an indication that the hot-pluggable component is absent when the absence of electromagnetic energy is detected.

4. The computer system, as recited in claim 3, wherein the electromagnetic energy is infra-red energy, magnetic energy or ultrasonic energy.



5. The computer system of claim 1, wherein the connector is one of an edge connector, a cable connector, a fibre channel connector, and a USB connector.

6. A computer system comprising:

a means for generating electromagnetic energy located on a first side of a system board proximate a connector, the electromagnetic energy directed at least toward a second opposing side of the system board; and

a means for detecting electromagnetic energy located on the second side of the system board, the means for detecting electromagnetic energy detecting a presence of electromagnetic energy when a hot-pluggable component is not mated to the connector and the electromagnetic energy is thereby unobstructed by the hot-pluggable component, the means for detecting electromagnetic energy detector further detecting an absence of electromagnetic energy when the hot-pluggable component is mated to the connector and the electromagnetic energy is thereby obstructed by the hot-pluggable component.

7. The computer system, as recited in claim 6, further comprising a processing means for communicating with the means for detecting electromagnetic energy, the processing means for receiving the detection of the presence or absence of electromagnetic energy by the means for detecting electromagnetic energy.

8. The computer system, as recited in claim 7, further comprising a means for storing an indication that the hot-pluggable component is absent when the presence of

electromagnetic energy is detected and further for storing an indication that the hot-pluggable component is absent when the absence of electromagnetic energy is detected.

9. The computer system of claim 6, wherein the connector is an edge connector.

10. A computer system comprising:

a first electromagnetic energy source located on a first side of a system board proximate a first end of a connector, the first electromagnetic energy source for generating electromagnetic energy directed at least toward a second side of the system board opposing the first electromagnetic energy source;

a second electromagnetic energy source located on the first side of the system board proximate a second end of the connector, the second electromagnetic energy source for generating electromagnetic energy directed at least toward the second side of the system board opposing the second electromagnetic energy source;

a first electromagnetic energy detector located on the second side of the system board, the first electromagnetic energy detector for detecting a presence of electromagnetic energy from the first electromagnetic energy source when a hot-pluggable component is not mated to the connector and the electromagnetic energy from the first electromagnetic energy source is thereby unobstructed by the hot-pluggable component, the first electromagnetic energy detector further for detecting an absence of the electromagnetic energy from the first electromagnetic energy source when the hot-pluggable component is mated to the connector and the electromagnetic energy from the first electromagnetic energy source is thereby obstructed by the hot-pluggable component.

a second electromagnetic energy detector located on the second side of the system board, the second electromagnetic energy detector for detecting a presence of electromagnetic energy from the second electromagnetic energy source when the hot-pluggable component is not mated to the connector and the electromagnetic energy from the second electromagnetic energy source is thereby unobstructed by the hot-pluggable component, the second electromagnetic energy detector further for detecting an absence of the electromagnetic energy from the second electromagnetic energy source when the hot-pluggable component is mated to the edge connector and the electromagnetic energy from the second electromagnetic energy source is thereby obstructed by the hot-pluggable component.

11. The computer system of claim 10, wherein the connector is an edge connector.

12. A method for detecting the presence of a hot-pluggable component in a computer system comprising the steps of:

generating electromagnetic energy on a first side of a system board proximate a connector, the electromagnetic energy directed at least toward a second opposing side of the system board;

detecting a presence of the electromagnetic energy on the second side of the system board when the hot-pluggable component is not mated to the connector and the electromagnetic energy is thereby unobstructed by the hot-pluggable component; and

detecting an absence of electromagnetic energy on the second side of the system board when the hot-pluggable component is mated to the connector and the electromagnetic energy is thereby obstructed by the hot-pluggable component.

13. The method, as recited in claim 12, further comprising the step of communicating the detected presence or absence of electromagnetic energy to a processor.

14. The method, as recited in claim 13, further comprising the steps of:  
storing an indication that the hot-pluggable component is absent when the presence of electromagnetic energy is detected; and

storing an indication that the hot-pluggable component is present when the absence of electromagnetic energy is detected.

15. The method, as recited in claim 12, further comprising the step of locating a material which is impervious to the electromagnetic energy at a position on the hot-pluggable component so that the material obstructs the electromagnetic energy when the hot-pluggable component is mated to the connector.

16. The method, as recited in claim 12, wherein the step of generating the electromagnetic energy comprises the step of generating a beam of electromagnetic energy directed toward the second opposing side of the system board.

17. The method, as recited in claim 12, wherein the step of generating the electromagnetic energy comprises the step of:

generating a plurality of independent beams of electromagnetic energy directed toward the second opposing side of the system board, a source of each of the plurality of beams located progressively more distant from the system board; and

further wherein the steps of detecting the presence or absence of the electromagnetic energy comprises the step of:

independently detecting the presence or absence of each of the plurality of beams on the second side of the system board, a detector of each of the plurality of beams located progressively more distant from the system board, the plurality of beams sequentially becoming obstructed as the hot-pluggable component is mated to the connector and the electromagnetic energy is obstructed by the hot-pluggable component and the beams sequentially becoming unobstructed as the hot-pluggable component is removed from the connector and the electromagnetic thereby becomes unobstructed by the hot-pluggable component indicating the approach or retreat of the hot-pluggable component respectively.

18. The method, as recited in claim 12, wherein the electromagnetic energy is infra-red energy.